IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Stanley R. Krystek et al.

Serial No : Not yet known

Filed : May 10, 2001

For : MODIFIED INOSINE 5'-MONOPHOSPHATE

DEHYDROGENASE POLYPEPTIDES AND USES THEREOF

35 No. Arroyo Parkway Pasadena, California 91103 May 10, 2001

Assistant Commissioner for Patents Box Sequence Washington, D.C. 20231

SIR:

DECLARATION PURSUANT TO 37 C.F.R. §1.821(f)

I hereby declare that the content of the paper and computer readable copies of the Sequence Listings, submitted in the subject patent application in accordance with 37 C.F.R. §1.821(c) and (e), respectively, are the same.

Respectfully submitted,

Renato Marco P. Domingo

SEQUENCE LISTING

```
<110> Krystek, Stanley R.
      Sheriff, Steven
      Witmer, Mark R.
      Hollenbaugh, Diane L.
      Yan, Ning
      Mouravieff, Julie E.
      Einspahr, Howard M.
      Kish, Kevin
<120> MODIFIED INOSINE 5'-MONOPHOSPHATE DEHYDROGENASE
      POLYPEPTIDES AND USES THEREOF
<130> DB24NP
<140> Not yet known
<141> 2001-05-10
<150> 60/203,448
<151> 2000-05-10
<160> 65
<170> PatentIn Ver. 2.0
<210> 1
<211> 3
<212> PRT
<213> Homo sapiens
<400> 1
Asp Lys Thr
 1
<210> 2
<211> 3
<212> PRT
<213> Homo sapiens
<400> 2
Thr Pro Ile
 1
```

<210> 3

<211> 3

```
<212> PRT
<213> Homo sapiens
<400> 3
Ser Pro Ser
 1
<210> 4
<211> 3
<212> PRT
<213> Homo sapiens
<400> 4
Ser Ala His
 1
<210> 5
<211> 3
<212> PRT
<213> Homo sapiens
<400> 5
Lys Pro Ile
 1
 <210> 6
 <211> 3
 <212> PRT
 <213> Homo sapiens
 <400> 6
 Ile Val Asp
  1
 <210> 7
 <211> 3
 <212> PRT
 <213> Homo sapiens
 <400> 7
 Ala Leu Phe
   1
```

```
<210> 8
<211> 3
<212> PRT
<213> Homo sapiens
<400> 8
Ser Pro Thr
  1
<210> 9
<211> 3
<212> PRT
<213> Homo sapiens
<400> 9
Gly Gly Tyr
  1
<210> 10
<211> 3
<212> PRT
<213> Homo sapiens
<400> 10
 Gly Ser Gly
  1
 <210> 11
 <211> 4
 <212> PRT
 <213> Homo sapiens
 <400> 11
 Gly Ser Ser Trp
   1
 <210> 12
 <211> 4
 <212> PRT
 <213> Homo sapiens
 <400> 12
  Gln Pro Gln Ser
    1
```

```
<210> 13
<211> 4
<212> PRT
<213> Homo sapiens
<400> 13
Asn Ile Ile Pro
  1
<210> 14
<211> 4
<212> PRT
<213> Homo sapiens
<400> 14
Ser Pro Thr Gln
  1
<210> 15
<211> 4
<212> PRT
<213> Homo sapiens
 <400> 15
 Thr Arg Tyr Thr
   1
 <210> 16
 <211> 4
 <212> PRT
 <213> Homo sapiens
 <400> 16
 Ala Gly Arg Pro
   1
 <210> 17
 <211> 4
 <212> PRT
 <213> Homo sapiens
 <400> 17
```

```
Asn Gly Gln Tyr
<210> 18
<211> 4
<212> PRT
<213> Homo sapiens
<400> 18
Asn Ser Pro Leu
 1
<210> 19
<211> 4
<212> PRT
<213> Homo sapiens
<400> 19
Tyr Gly Thr Trp
 1
<210> 20
<211> 384
<212> PRT
<213> Homo sapiens
<400> 20
Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp
                 5
                                     10
                                                          15
Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
                                                     30
             20
                                 25
Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln
         35
                             40
Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro
     50
                         55
                                              60
Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
 65
                     70
                                         75
Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
```

90

85

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Asp Lys Thr Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 375 380

<210> 21

<211> 384

<212> PRT

<213> Homo sapiens

<400> 21

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Thr Pro 100 105 110

Ile Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr 115 120 125

Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp 130 135 140

Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr
165 170 175

Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg 180 185 190

Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala 195 200 205

Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala 210 215 220

Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val 225 230 235 240

Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met 245 250 255

Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe 260 265 270

Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp 275 280 285

Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala 290 295 300

Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys 305 310 315 320

Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His 325 330 335

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 375 380

<210> 22

<211> 384

<212> PRT

<213> Homo sapiens

< 400	0> 22	2													
Met 1	Ala	Asp	Tyr	Leu 5	Ile	Ser	Gly	Gly	Thr 10	Ser	Tyr	Val	Pro	Asp 15	Asp
Gly	Leu	Thr	Ala 20	Gln	Gln	Leu	Phe	Asn 25	Cys	Gly	Asp	Gly	Leu 30	Thr	Tyr
Asn	Asp	Phe 35	Leu	Ile	Leu	Pro	Gly 40	Tyr	Ile	Asp	Phe	Thr 45	Ala	Asp	Gln
Val	Asp 50	Leu	Thr	Ser	Ala	Leu 55	Thr	Lys	Lys	Ile	Thr 60	Leu	Lys	Thr	Pro
Leu 65	Val	Ser	Ser	Pro	Met 70	Asp	Thr	Val	Thr	Glu 75	Ala	Gly	Met	Ala	Ile 80
Ala	Met	Ala	Leu	Thr 85	Gly	Gly	Ile	Gly	Phe 90	Ile	His	His	Asn	Cys 95	Thr
Pro	Glu	Phe	Gln 100	Ala	Asn	Glu	Val	Arg 105	Lys	Val	Lys	Lys	Tyr 110	Ser	Pro
Ser	Leu	Leu 115	Суѕ	Gly	Ala	Ala	Ile 120	Gly	Thr	His	Glu	Asp 125	Asp	Lys	Tyr
Arg	Leu 130	Asp	Leu	Leu	Ala	Gln 135	Ala	Gly	Val	Asp	Val 140	Val	Val	Leu	Asp
Ser 145	Ser	Gln	Gly	Asn	Ser 150	Ile	Phe	Gln	Ile	Asn 155	Met	Ile	Lys	Tyr	Ile 160
Lys	Asp	Lys	Tyr	Pro 165	Asn	Leu	Gln	Val		Gly		Asn	Val	Val 175	Thr
Ala	Ala	Gln	Ala 180	Lys	Asn	Leu	Ile	Asp 185	Ala	Gly	Val	Asp	Ala 190	Leu	Arg
Val	Gly	Met 195	Gly	Ser	Gly	Ser	Ile 200	Cys	Ile	Thr	Gln	Glu 205	Val	Leu	Ala
Cys	Gly 210	Arg	Pro	Gln	Ala	Thr 215	Ala	Val	Tyr	Lys	Val 220	Ser	Glu	Tyr	Ala

Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met

Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val

24	5 25	50 255

Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe 260 265 270

Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp 275 280 285

Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala 290 295 300

Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys 305 310 315 320

Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His 325 330 335

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 380

<210> 23

<211> 384

<212> PRT

<213> Homo sapiens

<400> 23

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro
50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ser Ala His Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys

Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His 325 330 335

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 380

<210> 24

<211> 384

<212> PRT

<213> Homo sapiens

<400> 24

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr 20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Lys Pro 100 105 110

Ile Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr 115 120 125

Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp 130 135 140

Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe 260 265 Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe

<210> 25 <211> 384 <212> PRT <213> Homo sapiens	
<pre><400> 25 Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15</pre>	,
Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr 20 25 30	
Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45	
Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro	ı
Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 65 70 75 80	
Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95	
Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ile Val	
Asp Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr 115 120 125	
Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu Asp 130 135 140	I
Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile 145 150 155 160	
Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr 165 170 175	
Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg 180 185 190	
Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala	

Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala

	210					215					220				
Arg 225	Arg	Phe	Gly	Val	Pro 230	Val	Ile	Ala	Asp	Gly 235	Gly	Ile	Gln	Asn	Val 240
Gly	His	Ile	Ala	Lys 245	Ala	Leu	Ala	Leu	Gly 250	Ala	Ser	Thr	Val	Met 255	Met
Gly	Ser	Leu	Leu 260	Ala	Ala	Thr	Thr	Glu 265	Ala	Pro	Gly	Glu	Tyr 270	Phe	Phe
Ser	Asp	Gly 275	Ile	Arg	Leu	Lys	Lys 280	Tyr	Arg	Gly	Met	Gly 285	Ser	Leu	Asp
Ala	Met 290	Asp	Lys	His	Leu	Ser 295	Ser	Gln	Asn	Arg	Tyr 300	Phe	Ser	Glu	Ala
Asp 305	Lys	Ile	Lys	Val	Ala 310	Gln	Gly	Val	Ser	Gly 315	Ala	Val	Gln	Asp	Lys 320
Gly	Ser	Ile	His	Lys 325	Phe	Val	Pro	Tyr	Leu 330	Ile	Ala	Gly	Ile	Gln 335	His
Ser	Cys	Gln	Asp 340	Ile	Gly	Ala	Lys	Ser 345	Leu	Thr	Gln	Val	Arg 350	Ala	Met
Met	Tyr	Ser 355	Gly	Glu	Leu	Lys	Phe 360	Glu	Lys	Arg	Thr	Ser 365	Ser	Ala	Gln
Val	Glu	Gly	Gly	Val	His	Ser	Leu	His	Ser	Tyr	Glu	Lys	Arg	Leu	Phe

<210> 26

370

<211> 384

<212> PRT

<213> Homo sapiens

<400> 26

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10

380

375

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr \$20\$ \$25\$ 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ala Leu Phe Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val

Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met \$245\$ \$250\$

Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe 260 265 270

Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp 275 280 285

Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala 290 295 300

Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys 305 310 315 320

Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His
325 330 335

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 380

<210> 27

<211> 384

<212> PRT

<213> Homo sapiens

<400> 27

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr \$20\$ \$25\$ 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ser Pro 100 105 110

Thr Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 380

<210> 28

<211> 384

<212> PRT

<213> Homo sapiens

<400> 28

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Gly Gly 100 105 110

Tyr Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr 115 120 125

Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp 130 135 140

Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile 145 150 155 160

Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr
165 170 175

Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg

1_1

Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln

<210> 29

<211> 384

<212> PRT

<213> Homo sapiens

<400> 29

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Gly Ser Gly Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val

Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met \$245\$ \$250\$ \$255\$

Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe 260 265 270

Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp 275 280 285

Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala 290 295 300

Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys 305 310 315 320

Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His 325 330 335

Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala Gln 355 360 365

Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu Phe 370 375 380

<210> 30

<211> 384

<212> PRT

<213> Homo sapiens

<400> 30

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Gly Tyr Val Pro Glu Asp
1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Ala Ser Ala Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Phe Ile Asp Phe Ile Ala Asp Glu 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Arg Lys Ile Thr Leu Lys Thr Pro
50 55 60

Leu Ile Ser Ser Pro Met Asp Thr Val Thr Glu Ala Asp Met Ala Ile 65 70 75 80

Thr Leu Leu Cys Gly Ala Ala Val Gly Thr Arg Glu Asp Asp Lys Tyr 115 120 125

Arg Leu Asp Leu Leu Thr Gln Ala Gly Val Asp Val Ile Val Leu Asp 130 135 140

Ser Ser Gln Gly Asn Ser Val Tyr Gln Ile Ala Met Val His Tyr Ile 145 150 155 160

Lys Gln Lys Tyr Pro His Leu Gln Val Ile Gly Gly Asn Val Val Thr
165 170 175

Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Gly Leu Arg 180 185 190

Val Gly Met Gly Cys Gly Ser Ile Cys Ile Thr Gln Glu Val Met Ala 195 200 205

Cys Gly Arg Pro Gln Gly Thr Ala Val Tyr Lys Val Ala Glu Tyr Ala 210 215 220

Arg Arg Phe Gly Val Pro Ile Ile Ala Asp Gly Gly Ile Gln Thr Val 225 230 235 240

Gly His Val Val Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met \$245\$ \$250\$ \$255\$

Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe $260 \,$ $265 \,$ $270 \,$

Ser Asp Gly Val Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp 275 280 285

Ala Met Glu Lys Ser Ser Ser Ser Gln Lys Arg Tyr Phe Ser Glu Gly
290 295 300

Asp Lys Val Lys Ile Ala Gln Gly Val Ser Gly Ser Ile Gln Asp Lys 305 310 315 320

Gly Ser Ile Gln Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His 325 330 335

Gly Cys Gln Asp Ile Gly Ala Arg Ser Leu Ser Val Leu Arg Ser Met 340 345 350

Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Met Ser Ala Gln 355 360 365

Ile Glu Gly Gly Val His Gly Leu His Ser Tyr Glu Lys Arg Leu Tyr 370 380

<210> 31

<211> 385

<212> PRT

<213> Homo sapiens

<400> 31

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Gly Ser 100 105 110

Ser Trp Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys 115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr

145				150					155					160
Ile Lys	Asp	Lys	Tyr 165	Pro	Asn	Leu	Gln	Val 170	Ile	Gly	Gly	Asn	Val 175	Val
Thr Ala	Ala	Gln 180	Ala	Lys	Asn	Leu	Ile 185	Asp	Ala	Gly	Val	Asp 190	Ala	Leu
Arg Val	Gly 195	Met	Gly	Ser	Gly	Ser 200	Ile	Cys	Ile	Thr	Gln 205	Glu	Val	Leu
Ala Cys 210	Gly	Arg	Pro	Gln	Ala 215	Thr	Ala	Val	Tyr	Lys 220	Val	Ser	Glu	Tyr
Ala Arg 225	Arg	Phe	Gly	Val 230	Pro	Val	Ile	Ala	Asp 235	Gly	Gly	Ile	Gln	Asn 240
Val Gly	His	Ile	Ala 245	Lys	Ala	Leu	Ala	Leu 250	Gly	Ala	Ser	Thr	Val 255	Met
Met Gly	Ser	Leu 260	Leu	Ala	Ala	Thr	Thr 265	Glu	Ala	Pro	Gly	Glu 270	Tyr	Phe
Phe Ser	Asp 275	Gly	Ile	Arg	Leu	Lys 280	Lys	Tyr	Arg	Gly	Met 285	Gly	Ser	Leu
Asp Ala 290	Met	Asp	Lys	His	Leu 295	Ser	Ser	Gln	Asn	Arg 300	Tyr	Phe	Ser	Glu
Ala Asp 305	Lys	Ile	Lys	Val 310	Ala	Gln	Gly	Val	Ser 315	Gly	Ala	Val	Gln	Asp 320
Lys Gly	Ser	Ile	His 325	Lys	Phe	Val	Pro	Tyr 330	Leu	Ile	Ala	Gly	Ile 335	Gln
His Ser	Cys	Gln 340	Asp	Ile	Gly	Ala	Lys 345	Ser	Leu	Thr	Gln	Val 350	Arg	Ala
Met Met	Tyr 355	Ser	Gly	Glu	Leu	Lys 360	Phe	Glu	Lys	Arg	Thr 365	Ser	Ser	Ala
Gln Val 370	Glu	Gly	Gly	Val	His 375	Ser	Leu	His	Ser	Tyr 380	Glu	Lys	Arg	Leu
Phe 385														

<210> 32 <211> 385 <212> PRT <213> Homo sapiens <400> 32 Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr 20 25 Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 40 Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 55 Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 75 Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Gln Pro 100 105 110 Gln Ser Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys 115 120 Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val 165 170 Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 200

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met 245 250 255

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 375 380

Phe 385

<210> 33

<211> 385

<212> PRT

<213> Homo sapiens

<400> 33

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Asn Ile 100 105 110

Ile Pro Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys
115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 160

Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val 165 170 175

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 190

Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met 245 250 255

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300 Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln
325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 380

Phe 385

<210> 34

<211> 385

<212> PRT

<213> Homo sapiens

<400> 34

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr 20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ser Pro 100 105 110

Thr Gln Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys

115	120	125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 160

Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val
165 170 175

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 190

Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met 245 250 255

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu

370 375 380

Phe 385

<210> 35

<211> 385

<212> PRT

<213> Homo sapiens

<400> 35

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Thr Arg 100 105 110

Tyr Thr Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys
115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val
165 170 175

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 190 Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met 245 250 255

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 375 380

Phe

<210> 36

<211> 385

<212> PRT

<213> Homo sapiens

<400> 36

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln
35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro
50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Ala Gly
100 105 110

Arg Pro Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys
115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 160

Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val
165 170 175

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 190

Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met \$245\$ \$250\$ \$255\$

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 380

Phe 385

<210> 37

<211> 385

<212> PRT

<213> Homo sapiens

<400> 37

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr

				85					90					95	
Pro	Glu	Phe	Gln 100	Ala	Asn	Glu	Val	Arg 105	Lys	Val	Lys	Lys	Tyr 110	Asn	Gly
Gln	Tyr	Leu 115	Leu	Cys	Gly	Ala	Ala 120	Ile	Gly	Thr	His	Glu 125	Asp	Asp	Lys
Tyr	Arg 130	Leu	Asp	Leu	Leu	Ala 135	Gln	Ala	Gly	Val	Asp 140	Val	Val	Val	Leu
Asp 145	Ser	Ser	Gln	Gly	Asn 150	Ser	Ile	Phe	Gln	Ile 155	Asn	Met	Ile	Lys	Tyr 160
Ile	Lys	Asp	Lys	Tyr 165	Pro	Asn	Leu	Gln	Val 170	Ile	Gly	Gly	Asn	Val 175	Val
Thr	Ala	Ala	Gln 180	Ala	Lys	Asn	Leu	Ile 185	Asp	Ala	Gly	Val	Asp 190	Ala	Leu
Arg	Val	Gly 195	Met	Gly	Ser	Gly	Ser 200	Ile	Cys	Ile	Thr	Gln 205	Glu	Val	Leu
Ala	Cys 210	Gly	Arg	Pro	Gln	Ala 215	Thr	Ala	Val	Tyr	Lys 220	Val	Ser	Glu	Tyr
Ala 225	Arg	Arg	Phe	Gly	Val 230	Pro	Val	Ile	Ala	Asp 235	Gly	Gly	Ile	Gln	Asn 240
Val	Gly	His	Ile	Ala 245	Lys	Ala	Leu	Ala	Leu 250	Gly	Ala	Ser	Thr	Val 255	Met
Met	Gly	Ser	Leu 260	Leu	Ala	Ala	Thr	Thr 265	Glu	Ala	Pro	Gly	Glu 270	Tyr	Phe
Phe	Ser	Asp 275	Gly	Ile	Arg	Leu	Lys 280	Lys	Tyr	Arg	Gly	Met 285	Gly	Ser	Leu
Asp	Ala 290	Met	Asp	Lys	His	Leu 295	Ser	Ser	Gln	Asn	Arg 300	Tyr	Phe	Ser	Glu
Ala 305	Asp	Lys	Ile	Lys	Val 310	Ala	Gln	Gly	Val	Ser 315	Gly	Ala	Val	Gln	Asp 320
Lys	Gly	Ser	Ile	His 325	Lys	Phe	Val	Pro	Tyr 330	Leu	Ile	Ala	Gly	Ile 335	Gln

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala

340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 380

Phe

<210> 38

<211> 385

<212> PRT

<213> Homo sapiens

<400> 38

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln 35 40 45

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile 65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Asn Ser 100 105 110

Pro Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys 115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 160 Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val 165 170 175

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu 180 185 190

Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met \$245\$ \$250\$

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 375 380

Phe 385

<210> 39 <211> 385

<212> PRT

<213> Homo sapiens

<400> 39

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln
35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro
50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr \$85\$ 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Tyr Gly
100 105 110

Thr Trp Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys
115 120 125

Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Leu 130 135 140

Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr 145 150 155 160

Ile Lys Asp Lys Tyr Pro Asn Leu Gl
n Val Ile Gly Gly Asn Val Val \$165\$ \$170\$ \$175\$

Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu
180 185 190

Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu 195 200 205

Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr 210 215 220

Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn 225 230 235 240

Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met 245 250 255

Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe 260 265 270

Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu 275 280 285

Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu 290 295 300

Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp 305 310 315 320

Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln 325 330 335

His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg Ala 340 345 350

Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser Ala 355 360 365

Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg Leu 370 375 380

Phe 385

<210> 40

<211> 1155 <212> DNA

<213> Homo sapiens

<400> 40

atggccgact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60 cagcagctct tcaactgcgg agacggcctc acctacaatg actttctcat tctccctggg 120 tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180 cttaagaccc cactggttc ctctcccatg gacacagtca cagaggctgg gatggccata 240 gcaatggacg ttacaggcgg tattggcttc atcaccaca actgtacacc tgaattccag 300 gccaatgaag ttcggaaagt gaagaaatat gacaagaccc tgctgtgtgg ggcagccatt 360 ggcactcatg aggatgacaa gtataggctg gacttgctcg cccaggctgg tgtggatgta 420 gtggttttgg actctcca gggaaattcc atctccaga tcaatatgat caagtacatc 480 aaagacaaat accctaatct ccaagtcatt ggaggcaatg tggtcactgc tgccaggcc 540 aagaacctca ttgatgcagg tgtggatgcc ctgcgggtgg gcatgggaag tggctccatc 600

```
tgcattacgc aggaagtgct ggcctgtggg cggccccaag caacagcagt gtacaaggtg 660
tcagagtatg cacggegett tggtgtteeg gteattgetg atggaggaat ecaaaatgtg 720
ggtcatattg cgaaagcctt ggcccttggg gcctccacag tcatgatggg ctctctcctg 780
gctgccacca ctgaggcccc tggtgaatac ttcttttccg atgggatccg gctaaagaaa 840
tatogoggta tgggttotot cgatgocatg gacaagoaco toagoagoca gaacagatat 900
ttcagtgaag ctgacaaaat caaagtggcc cagggagtgt ctggtgctgt gcaggacaaa 960
gggtcaatcc acaaatttgt cocttacctg attgctggca tccaacactc atgccaggae 1020
attggtgcca agagcttgac ccaagtccga gccatgatgt actctgggga gcttaagttt 1080
gagaagagaa cgtcctcagc ccaggtggaa ggtggcgtcc atagcctcca ttcgtatgag 1140
                                                                  1155
aagcggcttt tctga
<210> 41
<211> 1155
<212> DNA
<213> Homo sapiens
<400> 41
atggccgact acctgattag tgggggcacg tectaegtge cagaegaegg acteacagea 60
cagcagetet teaactgegg agacggeete acetacaatg aettteteat tetecetggg 120
tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180
cttaagaccc cactggtttc ctctcccatg gacacagtca cagaggctgg gatggccata 240
gcaatggcgc ttacaggcgg tattggcttc atccaccaca actgtacacc tgaattccag 300
gccaatgaag ttcggaaagt gaagaaatat tctccgagcc tgctgtgtgg ggcagccatt 360
ggcactcatg aggatgacaa gtataggctg gacttgctcg cccaggctgg tgtggatgta 420
gtggttttgg actcttccca gggaaattcc atcttccaga tcaatatgat caagtacatc 480
aaaqacaaat accctaatct ccaagtcatt ggaggcaatg tggtcactgc tgcccaggcc 540
aagaacctca ttgatgcagg tgtggatgcc ctgcgggtgg gcatgggaag tggctccatc 600
tgcattacgc aggaagtgct ggcctgtggg cggccccaag caacagcagt gtacaaggtg 660
tcagagtatg cacggcgctt tggtgttccg gtcattgctg atggaggaat ccaaaatgtg 720
ggtcatattg cgaaagcctt ggcccttggg gcctccacag tcatgatggg ctctctcctg 780
gctgccacca ctgaggcccc tggtgaatac ttcttttccg atgggatccg gctaaagaaa 840
tatcgcggta tgggttctct cgatgccatg gacaagcacc tcagcagcca gaacagatat 900
ttcagtgaag ctgacaaaat caaagtggcc cagggagtgt ctggtgctgt gcaggacaaa 960
gggtcaatce acaaatttgt ccettacetg attgetggca tecaacacte atgecaggae 1020
attggtgcca agagettgae ecaagteega geeatgatgt actetgggga gettaagttt 1080
gagaagagaa cgtcctcagc ccaggtggaa ggtggcgtcc atagcctcca ttcgtatgag 1140
aagcggcttt tctga
                                                                  1155
<210> 42
<211> 1155
<212> DNA
<213> Homo sapiens
<400> 42
atggccgact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60
cagcagetet teaactgegg agacggeete acetacaatg aettteteat tetecetggg 120
tacategaet teaetgeaga eeaggtggae etgaettetg etetgaeeaa gaaaateaet 180
cttaagaccc cactggtttc ctctcccatg gacacagtca cagaggctgg gatggccata 240
```

```
qcaatqqcqc ttacaqqcqq tattqqcttc atccaccaca actqtacacc tqaattccag 300
gccaatgaag ttcggaaagt gaagaaatat ggttccggcc tgctgtgtgg ggcagccatt 360
ggcactcatg aggatgacaa gtataggctg gacttgctcg cccaggctgg tgtggatgta 420
gtggttttgg actcttccca gggaaattcc atcttccaga tcaatatgat caagtacatc 480
aaagacaaat accctaatct ccaagtcatt ggaggcaatg tggtcactgc tgcccaggcc 540
aagaacctca ttgatgcagg tgtggatgcc ctgcgggtgg gcatgggaag tggctccatc 600
tgcattacgc aggaagtgct ggcctgtggg cggccccaag caacagcagt gtacaaggtg 660
teagagtatg caeggegett tggtgtteeg gteattgetg atggaggaat ceaaaatgtg 720
ggtcatattg cgaaagcett ggceettggg geeteeaeag teatgatggg eteteteetg 780
getgecacca etgaggecce tggtgaatae ttetttteeg atgggateeg getaaagaaa 840
tatcgcggta tgggttctct cgatgccatg gacaagcacc tcagcagcca gaacagatat 900
ttcagtgaag ctgacaaaat caaagtggcc cagggagtgt ctggtgctgt gcaggacaaa 960
gggtcaatcc acaaatttgt cccttacctg attgctggca tccaacactc atgccaggac 1020
attggtgcca agagettgae ceaagteega gecatgatgt aetetgggga gettaagttt 1080
gagaagagaa cgtcctcagc ccaggtggaa ggtggcgtcc atagcctcca ttcgtatgag 1140
                                                                  1155
aagcggcttt tctga
<210> 43
<211> 1155
<212> DNA
<213> Homo sapiens
<400> 43
atgqccqact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60
cagcagetet teaactgegg agacggeete acetacaatg aettteteat tetecetggg 120
tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180
cttaagaccc cactggtttc ctctcccatg gacacagtca cagaggctgg gatggccata 240
geaatggege ttacaggegg tattggette atecaceaca aetgtacace tgaattecag 300
gccaatgaag ttoggaaagt gaagaaatat totoogacto tgotgtgtgg ggcagccatt 360
ggcactcatg aggatgacaa gtataggctg gacttgctcg cccaggctgg tgtggatgta 420
qtqqttttqq actcttccca qggaaattcc atcttccaga tcaatatgat caagtacatc 480
aaagacaaat accctaatct ccaagtcatt ggaggcaatg tggtcactgc tgcccaggcc 540
aagaacctca ttgatgcagg tgtggatgcc ctgcgggtgg gcatgggaag tggctccatc 600
tgcattacgc aggaagtgct ggcctgtggg cggccccaag caacagcagt gtacaaggtg 660
tcagagtatg cacggcgctt tggtgttccg gtcattgctg atggaggaat ccaaaatgtg 720
ggtcatattg cgaaagcett ggecettggg geeteeacag teatgatggg eteteteetg 780
gctgccacca ctgaggcccc tggtgaatac ttcttttccg atgggatccg gctaaagaaa 840
tategeggta tgggttetet egatgeeatg gacaageace teageageea gaacagatat 900
ttcagtgaag ctgacaaaat caaagtggcc cagggagtgt ctggtgctgt gcaggacaaa 960
gggtcaatcc acaaatttgt cccttacctg attgctggca tccaacactc atgccaggac 1020
attggtgcca agagcttgac ccaagtccga gccatgatgt actctgggga gcttaagttt 1080
gagaagagaa cgtcctcagc ccaggtggaa ggtggcgtcc atagcctcca ttcgtatgag 1140
                                                                  1155
aagcggcttt tctga
<210> 44
<211> 1155
<212> DNA
<213> Homo sapiens
```

```
<400> 44
atggcggact acctgatcag cggcggcacc ggctacgtgc ccgaggatgg gctcaccgcg 60
cagcagetet tegecagege egaeggeete acetacaaeg aetteetgat teteccagga 120
ttcatagact tcatagctga tgaggtggac ctgacctcag ccctgacccg gaagatcacg 180
ctgaagacgc cactgatete etececcatg gacactgtga cagaggetga catggecatt 240
gccatggctc tgatgggagg tattggtttc attcaccaca actgcacccc agagttccag 300
gccaacgagg tgcggaaggt caagaagttt gacaaaaccc tgctctgtgg ggcagctgtg 360
ggcacccgtg aggatgacaa ataccgtctg gacctgctca cccaggcggg cgtcgacgtc 420
atagtcttgg actcgtccca agggaattcg gtgtatcaaa tcgccatggt gcattacatc 480
aaacagaagt accccacct ccaggtgatt ggggggaacg tggtgacagc agcccaggcc 540
aagaacctga ttgatgctgg tgtggacggg ctgcgcgtgg gcatgggctg cggctccatc 600
tgcatcaccc aggaagtgat ggcctgtggt cggccccagg gcactgctgt gtacaaggtg 660
gctgagtatg cccggcgctt tggtgtgccc atcatagccg atggcggcat ccagaccgtg 720
ggacacgtgg tcaaggccct ggcccttgga gcctccacag tgatgatggg ctccctgctg 780
gccgccacta cggaggcccc tggcgagtac ttcttctcag acggggtgcg gctcaagaag 840
taccggggca tgggctcact ggatgccatg gagaagagca gcagcagcca gaaacgatac 900
ttcagcgagg gggataaagt gaagatcgcg cagggtgtct cgggctccat ccaggacaaa 960
ggatccattc agaagttcgt gccctacctc atagcaggca tccaacacgg ctgccaggat 1020
ateggggeee geageetgte tgteettegg teeatgatgt aeteaggaga geteaagttt 1080
gagaagcgga ccatgtcggc ccagattgag ggtggtgtcc atggcctgca ctcttacgaa 1140
                                                                  1155
aagcggctgt actga
<210> 45
<211> 1158
<212> DNA
<213> Homo sapiens
<400> 45
atggccgact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60
cagcagetet teaactgegg agaeggeete acetacaatg aettteteat tetecetggg 120
tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180
cttaagaccc cactggtttc ctctcccatg gacacagtca cagaggctgg gatggccata 240
gcaatggcgc ttacaggcgg tattggcttc atccaccaca actgtacacc tgaattccag 300
gccaatgaag ttcggaaagt gaagaaatat tctccgactc agctgctgtg tggggcagcc 360
attggcactc atgaggatga caagtatagg ctggacttgc tcgcccaggc tggtgtggat 420
gtagtggttt tggactette ccagggaaat tecatettee agateaatat gateaagtae 480
atcaaagaca aataccctaa tctccaagtc attggaggca atgtggtcac tgctgcccag 540
gccaagaacc tcattgatgc aggtgtggat gccctgcggg tgggcatggg aagtggctcc 600
atctgcatta cgcaggaagt gctggcctgt gggcggcccc aagcaacagc agtgtacaag 660
gtgtcagagt atgcacggcg ctttggtgtt ccggtcattg ctgatggagg aatccaaaat 720
gtgggtcata ttgcgaaagc cttggccctt ggggcctcca cagtcatgat gggctctctc 780
ctggctgcca ccactgaggc ccctggtgaa tacttctttt ccgatgggat ccggctaaag 840
aaatatcgcg gtatgggttc tctcgatgcc atggacaagc acctcagcag ccagaacaga 900
tatttcagtg aagctgacaa aatcaaagtg gcccagggag tgtctggtgc tgtgcaggac 960
aaagggtcaa tocacaaatt tgtocottac otgattgotg goatcoaaca otcatgocag 1020
gacattggtg ccaagagett gacceaagte egageeatga tgtactetgg ggagettaag 1080
tttgagaaga gaacgtcctc agcccaggtg gaaggtggcg tccatagcct ccattcgtat 1140
```

```
<210> 46
<211> 1158
<212> DNA
<213> Homo sapiens
<400> 46
atggccgact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60
cagcagetet teaactgegg agacggeete acetacaatg aettteteat tetecetggg 120
tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180
cttaagaccc cactggtttc ctctcccatg gacacagtca cagaggctgg gatggccata 240
gcaatggcgc ttacaggcgg tattggcttc atccaccaca actgtacacc tgaattccag 300
gccaatgaag ttcggaaagt gaagaaatat gctggtcgtc cgctgctgtg tggggcagcc 360
attggcactc atgaggatga caagtatagg ctggacttgc tcgcccaggc tggtgtggat 420
gtagtggttt tggactcttc ccagggaaat tccatcttcc agatcaatat gatcaagtac 480
atcaaagaca aataccetaa teteeaagte attggaggea atgtggteae tgetgeecag 540
gccaagaacc tcattgatgc aggtgtggat gccctgcggg tgggcatggg aagtggctcc 600
atctgcatta cgcaggaagt gctggcctgt gggcggcccc aagcaacagc agtgtacaag 660
gtgtcagagt atgcacggcg ctttggtgtt ccggtcattg ctgatggagg aatccaaaat 720
gtgggtcata ttgcgaaagc cttggccctt ggggcctcca cagtcatgat gggctctctc 780
ctggctgcca ccactgaggc ccctggtgaa tacttctttt ccgatgggat ccggctaaag 840
aaatategeg gtatgggtte tetegatgee atggacaage aceteageag eeagaacaga 900
tatttcagtg aagctgacaa aatcaaagtg gcccagggag tgtctggtgc tgtgcaggac 960
aaagggtcaa tocacaaatt tgtoocttac otgattgotg goatocaaca otcatgocag 1020
gacattggtg ccaagagett gacccaagtc cgagccatga tgtactctgg ggagettaag 1080
tttgagaaga gaacgtcetc ageccaggtg gaaggtggeg tecatageet ccattegtat 1140
                                                                  1158
gagaagcggc ttttctga
<210> 47
<211> 1158
<212> DNA
<213> Homo sapiens
<400> 47
atggccgact acctgattag tgggggcacg tcctacgtgc cagacgacgg actcacagca 60
cagcagetet teaactgegg agacggeete acetacaatg acttteteat tetecetggg 120
tacatcgact tcactgcaga ccaggtggac ctgacttctg ctctgaccaa gaaaatcact 180
ettaagacce cactggttte eteteceatg gacacagtea cagaggetgg gatggeeata 240
gcaatggcgc ttacaggcgg tattggcttc atccaccaca actgtacacc tgaattccag 300
gccaatgaag ttcggaaagt gaagaaatat aactctccgc ttctgctgtg tggggcagcc 360
attggcactc atgaggatga caagtatagg ctggacttgc tcgcccaggc tggtgtggat 420
gtagtggttt tggactcttc ccagggaaat tccatcttcc agatcaatat gatcaagtac 480
atcaaagaca aataccctaa tetecaagte attggaggea atgtggteae tgetgeecag 540
gecaagaace teattgatge aggtgtggat geeetgeggg tgggeatggg aagtggetee 600
atotgoatta ogcaggaagt gotggootgt gggoggoooc aagcaacago agtgtacaag 660
gtgtcagagt atgcacggcg ctttggtgtt ccggtcattg ctgatggagg aatccaaaat 720
gtgggtcata ttgcgaaagc cttggccctt ggggcctcca cagtcatgat gggctctctc 780
```

ctggctgcca ccactgaggc ccctggtgaa tacttcttt ccgatgggat ccggctaaag 840
aaatatcgcg gtatgggttc tctcgatgcc atggacaagc acctcagcag ccagaacaga 900
tatttcagtg aagctgacaa aatcaaagtg gcccagggag tgtctggtgc tgtgcaggac 960
aaagggtcaa tccacaaatt tgtcccttac ctgattgctg gcatccaaca ctcatgccag 1020
gacattggtg ccaagagctt gacccaagtc cgagccatga tgtactctgg ggagcttaag 1080
tttgagaaga gaacgtcctc agcccaggtg gaaggtggcg tccatagcct ccattcgtat 1140
gagaagcggc ttttctga

<210> 48

<211> 514

<212> PRT

<213> Homo sapiens

<400> 48

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Gly Tyr Val Pro Glu Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Ala Ser Ala Asp Asp Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Phe Ile Asp Phe Ile Ala Asp Glu 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Arg Lys Ile Thr Leu Lys Thr Pro
50 55 60

Leu Ile Ser Ser Pro Met Asp Thr Val Thr Glu Ala Asp Met Ala Ile
65 70 75 80

Ala Met Ala Leu Met Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Asn Phe Glu Gln
100 105 110

Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Ser His Thr Val Gly
115 120 125

Asp Val Leu Glu Ala Lys Met Arg His Gly Phe Ser Gly Ile Pro Ile 130 135 140

Thr Glu Thr Gly Thr Met Gly Ser Lys Leu Val Gly Ile Val Thr Ser 145 150 155 160

Arg Asp Ile Asp Phe Leu Ala Glu Lys Asp His Thr Thr Leu Leu Ser 165 170 175

Glu Val Met Thr Pro Arg Ile Glu Leu Val Val Ala Pro Ala Gly Val

			180					185					190		
Thr	Leu	Lys 195	Glu	Ala	Asn	Glu	Ile 200	Leu	Gln	Arg	Ser	Lys 205	Lys	Gly	Lys
Leu	Pro 210	Ile	Val	Asn	Asp	Cys 215	Asp	Glu	Leu	Val	Ala 220	Ile	Ile	Ala	Arq
Thr 225	Asp	Leu	Lys	Lys	Asn 230	Arg	Asp	Tyr	Pro	Leu 235	Ala	Ser	Lys	Asp	Se1
Gln	Lys	Gln	Leu	Leu 245	Cys	Gly	Ala	Ala	Val 250	Gly	Thr	Arg	Glu	Asp 255	Asp
Lys	Tyr	Arg	Leu 260	Asp	Leu	Leu	Thr	Gln 265	Ala	Gly	Val	Asp	Val 270	Ile	Va]
Leu	Asp	Ser 275	Ser	Gln	Gly	Asn	Ser 280	Val	Tyr	Gln	Ile	Ala 285	Met	Val	His
Tyr	Ile 290	Lys	Gln	Lys	Tyr	Pro 295	His	Leu	Gln	Val	Ile 300	Gly	Gly	Asn	Val
Val 305	Thr	Ala	Ala	Gln	Ala 310	Lys	Asn	Leu	Ile	Asp 315	Ala	Gly	Val	Asp	Gl ₃ 320
Leu	Arg	Val	Gly	Met 325	Gly	Суѕ	Gly	Ser	Ile 330	Суѕ	Ile	Thr	Gln	Glu 335	Val
Met	Ala	Cys	Gly 340	Arg	Pro	Gln	Gly	Thr 345	Ala	Val	Tyr	Lys	Val 350	Ala	Glu
Tyr	Ala	Arg 355	Arg	Phe	Gly	Val	Pro 360	Ile	Ile	Ala	Asp	Gly 365	Gly	Ile	Glr
Thr	Val 370	Gly	His	Val	Val	Lys 375	Ala	Leu	Ala	Leu	Gly 380	Ala	Ser	Thr	Val
Met 385	Met	Gly	Ser	Leu	Leu 390	Ala	Ala	Thr	Thr	Glu 395	Ala	Pro	Gly	Glu	Туг 400
Phe	Phe	Ser	Asp	Gly 405	Val	Arg	Leu	Lys	Lys 410	Tyr	Arg	Gly	Met	Gly 415	Ser
Len	Asn	Ala	Met	Glu	Lvs	Ser	Ser	Ser	Ser	Gln	Tays	Δνα	Tur	Pho	Sar

Glu Gly Asp Lys Val Lys Ile Ala Gln Gly Val Ser Gly Ser Ile Gln

435 440 445

Asp Lys Gly Ser Ile Gln Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile 450 455 460

Gln His Gly Cys Gln Asp Ile Gly Ala Arg Ser Leu Ser Val Leu Arg 465 470 475 480

Ser Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Met Ser 485 490 495

Ala Gln Ile Glu Gly Gly Val His Gly Leu His Ser Tyr Glu Lys Arg
500 505 510

Leu Tyr

<210> 49

<211> 514

<212> PRT

<213> Homo sapiens

<400> 49

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp 1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln
35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile
65 70 75 80

Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr $85 \hspace{1cm} 90 \hspace{1cm} 95$

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Glu Gln
100 105 110

Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Lys Asp Arg Val Arg 115 120 125

Asp Val Phe Glu Ala Lys Ala Arg His Gly Phe Cys Gly Ile Pro Ile Thr Asp Thr Gly Arg Met Gly Ser Arg Leu Val Gly Ile Ile Ser Ser Arg Asp Ile Asp Phe Leu Lys Glu Glu Glu His Asp Cys Phe Leu Glu Glu Ile Met Thr Lys Arg Glu Asp Leu Val Val Ala Pro Ala Gly Ile Thr Leu Lys Glu Ala Asn Glu Ile Leu Gln Arg Ser Lys Lys Gly Lys Leu Pro Ile Val Asn Glu Asp Asp Glu Leu Val Ala Ile Ile Ala Arg Thr Asp Leu Lys Lys Asn Arg Asp Tyr Pro Leu Ala Ser Lys Asp Ala Lys Lys Gln Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val Val Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val

Met 385	Met	Gly	Ser	Leu	Leu 390	Ala	Ala	Thr	Thr	Glu 395	Ala	Pro	Gly	Glu	Tyr 400	
Phe	Phe	Ser	Asp	Gly 405	Ile	Arg	Leu	Lys	Lys 410	Tyr	Arg	Gly	Met	Gly 415	Ser	
Leu	Asp	Ala	Met 420	Asp	Lys	His	Leu	Ser 425	Ser	Gln	Asn	Arg	Tyr 430	Phe	Ser	
Glu	Ala	Asp 435	Lys	Ile	Lys	Val	Ala 440	Gln	Gly	Val	Ser	Gly 445	Ala	Val	Gln	
Asp	Lys 450	Gly	Ser	Ile	His	Lys 455	Phe	Val	Pro	Tyr	Leu 460	Ile	Ala	Gly	Ile	
Gln 465	His	Ser	Cys	Gln	Asp 470	Ile	Gly	Ala	Lys	Ser 475	Leu	Thr	Gln	Val	Arg 480	
Ala	Met	Met	Tyr	Ser 485	Gly	Glu	Leu	Lys	Phe 490	Glu	Lys	Arg	Thr	Ser 495	Ser	
Ala	Gln	Val	Glu 500	Gly	Gly	Val	His	Ser 505	Leu	His	Ser	Tyr	Glu 510	Lys	Arg	
Leu Phe																
<211 <212 <213	<210> 50 <211> 33 <212> DNA <213> Homo sapiens															
)> 50 catca		ggct	gact	a co	ctgat	cago	c ggc	2							33
<210 <211	<pre>ctacgtcata tggctgacta cctgatcagc ggc <210> 51 <211> 37 <212> DNA</pre>															
			sapie	ens												
)> 51 :gtaa		ttca	ıgtac	a go	eeget	tttc	gta	agag	ł						37
<211 <212	<210> 52 <211> 33 <212> DNA															
<213) HC	omo S	apie	:115												

<400> 52 ctacgtcata tggccgacta cctgattagt ggg	33
<210> 53 <211> 35 <212> DNA <213> Homo sapiens	
<400> 53 cgatgtaagc tttcagaaaa gccgcttctc atacg	35
<210> 54 <211> 25 <212> DNA <213> Homo sapiens	
<400> 54 ggaattccat atggccgact acctg	25
<210> 55 <211> 30 <212> DNA <213> Homo sapiens <400> 55 ggtcttgtca tatttcttca ctttccgaac	30
<210> 56 <211> 30 <212> DNA <213> Homo sapiens	
<400> 56 gctcggagaa tatttcttca ctttccgaac	30
<210> 57 <211> 30 <212> DNA <213> Homo sapiens	
<400> 57 gccggaacca tatttcttca ctttccgaac	30
<210> 58 <211> 33 <212> DNA <213> Homo sapiens	

<400> 58 ctgagtcgga gaatatttct tcactttccg aac	33												
<210> 59 <211> 33 <212> DNA <213> Homo sapiens													
<400> 59 cggacgacca gcatatttct tcactttccg aac	33												
<210> 60 <211> 33 <212> DNA <213> Homo sapiens													
<400> 60 aagcggagag ttatatttct tcactttccg aac													
<210> 61 <211> 133 <212> PRT <213> Homo sapiens													
<400> 61													
Glu Gln Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Se 1 5 10	r His Thr 15												
Val Gly Asp Val Leu Glu Ala Lys Met Arg His Gly Phe Se													
Pro Ile Thr Glu Thr Gly Thr Met Gly Ser Lys Leu Val Gl	y Ile Val												
Thr Ser Arg Asp Ile Asp Phe Leu Ala Glu Lys Asp His Th	r Thr Leu												
Leu Ser Glu Val Met Thr Pro Arg Ile Glu Leu Val Val Al 65 70 75	a Pro Ala 80												
Gly Val Thr Leu Lys Glu Ala Asn Glu Ile Leu Gln Arg Se 85 90	r Lys Lys 95												
Gly Lys Leu Pro Ile Val Asn Asp Cys Asp Glu Leu Val Al													
Ala Arg Thr Asp Leu Lys Lys Asn Arg Asp Tyr Pro Leu Al	a Ser Lys												

115 120 125

Asp Ser Gln Lys Gln 130

<210> 62

<211> 514

<212> PRT

<213> Homo sapiens

<300>

<301> Gu, Jing Jin Spychala, Jozef Mitchell, Beverly S.

<302> Regulation of the Human Inosine Monophosphate Dehydrogenase Type I Gene

<303> J. Biol. Chem.

<304> 272

<305> 7

<306> 4458-4466

<307> February 14, 1997

<400> 62

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Gly Tyr Val Pro Glu Asp
1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Ala Ser Ala Asp Gly Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Phe Ile Asp Phe Ile Ala Asp Glu 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Arg Lys Ile Thr Leu Lys Thr Pro 50 55 60

Leu Ile Ser Ser Pro Met Asp Thr Val Thr Glu Ala Asp Met Ala Ile
65 70 75 80

Ala Met Ala Leu Met Gly Gly Ile Gly Phe Ile His His Asn Cys Thr 85 90 95

Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Phe Glu Gln
100 105 110

Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Ser His Thr Val Gly
115 120 125

Asp Val Leu Glu Ala Lys Met Arg His Gly Phe Ser Gly Ile Pro Ile Thr Glu Thr Gly Thr Met Gly Ser Lys Leu Val Gly Ile Val Thr Ser Arg Asp Ile Asp Phe Leu Ala Glu Lys Asp His Thr Thr Leu Leu Ser Glu Val Met Thr Pro Arg Ile Glu Leu Val Val Ala Pro Ala Gly Val Thr Leu Lys Glu Ala Asn Glu Ile Leu Gln Arg Ser Lys Lys Gly Lys Leu Pro Ile Val Asn Asp Cys Asp Glu Leu Val Ala Ile Ile Ala Arg Thr Asp Leu Lys Lys Asn Arg Asp Tyr Pro Leu Ala Ser Lys Asp Ser Gln Lys Gln Leu Leu Cys Gly Ala Ala Val Gly Thr Arg Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Thr Gln Ala Gly Val Asp Val Ile Val 265 270 Leu Asp Ser Ser Gln Gly Asn Ser Val Tyr Gln Ile Ala Met Val His Tyr Ile Lys Gln Lys Tyr Pro His Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Gly Leu Arq Val Gly Met Gly Cys Gly Ser Ile Cys Ile Thr Gln Glu Val Met Ala Cys Gly Arg Pro Gln Gly Thr Ala Val Tyr Lys Val Ala Glu Tyr Ala Arg Arg Phe Gly Val Pro Ile Ile Ala Asp Gly Gly Ile Gln Thr Val Gly His Val Val Lys Ala Leu Ala Leu Gly Ala Ser Thr Val

Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr 385

Phe Phe Ser Asp Gly Val Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser 405

Leu Asp Ala Met Glu Lys Ser Ser Ser Ser Gln Lys Arg Tyr Phe Ser 420

Glu Gly Asp Lys Val Lys Tle Ala Gln Gly Val Ser Gly Ser Ile Gln

Asp Lys Gly Ser Ile Gln Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile 450 455 460

Gln His Gly Cys Gln Asp Ile Gly Ala Arg Ser Leu Ser Val Leu Arg 465 470 475 480

Ser Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Met Ser 485 490 495

Ala Gln Ile Glu Gly Gly Val His Gly Leu His Ser Tyr Glu Lys Arg
500 505 510

Leu Tyr

<210> 63 <211> 514 <212> PRT <213> Homo sapiens

<300>

<301> Collart, Frank R. Huberman, Eliezer

<302> Cloning and Sequence Analysis of the Human and Chinese Hamster Inosine-5'-monophosphate Dehydrogenase cDNAs

<303> J. Biol. Chem.

<304> 263 <305> 30

<306> 15769-15772

<307> October 25, 1988

<400> 63

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Ser Tyr Val Pro Asp Asp
1 5 10 15

Gly Leu Thr Ala Gln Gln Leu Phe Asn Cys Gly Asp Gly Leu Thr Tyr Asn Asp Phe Leu Ile Leu Pro Gly Tyr Ile Asp Phe Thr Ala Asp Gln Val Asp Leu Thr Ser Ala Leu Thr Lys Lys Ile Thr Leu Lys Thr Pro Leu Val Ser Ser Pro Met Asp Thr Val Thr Glu Ala Gly Met Ala Ile Ala Met Ala Leu Thr Gly Gly Ile Gly Phe Ile His His Asn Cys Thr Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Tyr Glu Gln Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Lys Asp Arg Val Arg Asp Val Phe Glu Ala Lys Ala Arg His Gly Phe Cys Gly Ile Pro Ile Thr Asp Thr Gly Arg Met Gly Ser Arg Leu Val Gly Ile Ile Ser Ser Arg Asp Ile Asp Phe Leu Lys Glu Glu Glu His Asp Cys Phe Leu Glu Glu Ile Met Thr Lys Arg Glu Asp Leu Val Val Ala Pro Arg Ser Ile Thr Leu Lys Glu Ala Asn Glu Ile Leu Gln Arg Ser Lys Lys Gly Lys Leu Pro Ile Val Asn Glu Asp Asp Glu Leu Val Ala Ile Ile Ala Arg Thr Asp Leu Lys Lys Asn Arg Asp Tyr Pro Leu Ala Ser Lys Asp Ala Lys Lys Gln Leu Leu Cys Gly Ala Ala Ile Gly Thr His Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Ala Gln Ala Gly Val Asp Val Val

Leu Asp Ser Ser Gln Gly Asn Ser Ile Phe Gln Ile Asn Met Ile Lys Tyr Ile Lys Asp Lys Tyr Pro Asn Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Ala Leu Arg Val Gly Met Gly Ser Gly Ser Ile Cys Ile Thr Gln Glu Val Leu Ala Cys Gly Arg Pro Gln Ala Thr Ala Val Tyr Lys Val Ser Glu Tyr Ala Arg Arg Phe Gly Val Pro Val Ile Ala Asp Gly Gly Ile Gln Asn Val Gly His Ile Ala Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Ile Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser Leu Asp Ala Met Asp Lys His Leu Ser Ser Gln Asn Arg Tyr Phe Ser Glu Ala Asp Lys Ile Lys Val Ala Gln Gly Val Ser Gly Ala Val Gln Asp Lys Gly Ser Ile His Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile Gln His Ser Cys Gln Asp Ile Gly Ala Lys Ser Leu Thr Gln Val Arg

Leu Phe

Ala Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Ser Ser

Ala Gln Val Glu Gly Gly Val His Ser Leu His Ser Tyr Glu Lys Arg

```
<210> 64
<211> 514
<212> PRT
<213> Homo sapiens
<300>
<301> Dayton, Jennifer S.
      Lindsten, Tullia
      Thompson, Craig B.
      Mitchell, Beverly S.
<302> Effects of Human T Lymphocyte Activation on Inosine
      Monophosphate Dehydrogenase Expression
<303> J. Immunol.
<304> 152
<306> 984-991
<307> 1994
<400> 64
Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Gly Tyr Val Pro Glu Asp
  1
                  5
                                      10
                                                           15
Gly Leu Thr Ala His Glu Leu Phe Ala Ser Ala Asp Gly Leu Thr Tyr
             20
                                  25
                                                      30
Asn Asp Phe Leu Ile Leu Pro Gly Phe Ile Asp Phe Ile Ala Asp Glu
                              40
         35
                                                  45
Val Asp Leu Thr Ser Ala Leu Thr Arg Lys Ile Thr Leu Lys Thr Pro
     50
                          55
                                              60
Leu Ile Ser Ser Pro Met Asp Thr Val Thr Glu Ala Asp Met Ala Ile
                     70
                                          75
 65
Ala Met Ala Leu Met Gly Gly Ile Gly Phe Ile His His Asn Cys Thr
                 85
                                      90
Pro Glu Phe Gln Ala Asn Glu Val Arg Lys Val Lys Lys Phe Glu Gln
                                 105
Gly Phe Ile Thr Asp Pro Val Val Leu Ser Pro Ser His Thr Val Gly
        115
                             120
Asp Val Leu Glu Ala Lys Met Arg His Gly Phe Ser Gly Ile Pro Ile
    130
                        135
                                             140
Thr Glu Thr Gly Thr Met Gly Ser Lys Leu Val Gly Ile Val Thr Ser
145
                    150
```

Arg Asp Ile Asp Phe Leu Ala Glu Lys Asp His Thr Thr Leu Leu Ser Glu Val Met Thr Pro Arg Ile Glu Leu Val Val Ala Pro Ala Gly Val Thr Leu Lys Glu Ala Asn Glu Ile Leu Gln Arg Thr Lys Lys Gly Lys Leu Pro Ile Val Asn Asp Cys Asp Glu Leu Val Ala Ile Ile Ala Arg Thr Asp Leu Lys Lys Asn Arg Asp Tyr Pro Leu Ala Ser Lys Asp Ser Gln Lys Gln Leu Leu Cys Gly Ala Ala Val Gly Thr Arg Glu Asp Asp Lys Tyr Arg Leu Asp Leu Leu Thr Gln Ala Gly Val Asp Val Ile Val Phe His Ser Ser Gln Gly Asn Ser Val Tyr Gln Ile Ala Met Val His Tyr Ile Lys Gln Lys Tyr Pro His Leu Gln Val Ile Gly Gly Asn Val Val Thr Ala Ala Gln Ala Lys Asn Leu Ile Asp Ala Gly Val Asp Gly Leu Arg Val Gly Met Gly Cys Gly Ser Ile Cys Ile Thr Gln Glu Val Met Ala Cys Gly Arg Pro Gln Gly Thr Ala Val Tyr Lys Val Ala Glu Tyr Ala Arg Arg Phe Gly Val Pro Ile Ile Ala Asp Gly Gly Ile Gln Thr Val Gly His Val Val Lys Ala Leu Ala Leu Gly Ala Ser Thr Val Met Met Gly Ser Leu Leu Ala Ala Thr Thr Glu Ala Pro Gly Glu Tyr Phe Phe Ser Asp Gly Val Arg Leu Lys Lys Tyr Arg Gly Met Gly Ser

Leu Asp Pro Met Glu Lys Ser Ser Ser Ser Gln Lys Arg Tyr Phe Ser 420 425 430

Glu Gly Asp Lys Val Lys Ile Ala Gln Gly Val Ser Gly Ser Ile Gln 435 440 445

Asp Lys Gly Ser Ile Gln Lys Phe Val Pro Tyr Leu Ile Ala Gly Ile 450 455 460

Gln His Gly Cys Gln Asp Ile Gly Ala Arg Ser Leu Ser Val Leu Arg 465 470 475 480

Ser Met Met Tyr Ser Gly Glu Leu Lys Phe Glu Lys Arg Thr Met Ser 485 490 495

Pro Gln Ile Glu Gly Gly Val His Gly Leu His Ser Tyr Glu Lys Arg
500 505 510

Leu Tyr

<210> 65

<211> 514

<212> PRT

<213> Homo sapiens

<300>

<301> Natsumeda, Yutaka

<302> Two Distinct cDNAs for Human IMP Dehydrogenase

<303> J. Biol. Chem.

<304> 265

<305> 9

<306> 5292-5295

<307> March 25, 1990

<400> 65

Met Ala Asp Tyr Leu Ile Ser Gly Gly Thr Gly Tyr Val Pro Glu Asp 1 5 10

Gly Leu Thr Ala Gln Gln Leu Phe Ala Ser Ala Asp Asp Leu Thr Tyr
20 25 30

Asn Asp Phe Leu Ile Leu Pro Gly Phe Ile Asp Phe Ile Ala Asp Glu 35 40 45

Val Asp Leu Thr Ser Ala Leu Thr Arg Lys Ile Thr Leu Lys Thr Pro

50						55			60						
Leu	Ile	Ser	Ser	Pro	Met	Asp	Thr	Val	Thr	Glu	Ala	Asp	Met	i	

Leu 65	Ile	Ser	Ser	Pro	Met 70	Asp	Thr	Val	Thr	Glu 75	Ala	Asp	Met	Ala	Ile 80
Ala	Met	Ala	Leu	Met 85	Gly	Gly	Ile	Gly	Phe 90	Ile	His	His	Asn	Cys 95	Thr
Pro	Glu	Phe	Gln 100	Ala	Asn	Glu	Val	Arg 105	Lys	Val	Lys	Asn	Phe 110	Glu	Gln
Gly	Phe	Ile 115	Thr	Asp	Pro	Val	Val 120	Leu	Ser	Pro	Ser	His 125	Thr	Val	Gly
Asp	Val 130	Leu	Glu	Ala	Lys	Met 135	Arg	His	Gly	Phe	Ser 140	Gly	Ile	Pro	Ile
Thr 145	Glu	Thr	Gly	Thr	Met 150	Gly	Ser	Lys	Leu	Val 155	Gly	Ile	Val	Thr	Ser 160
Arg	Asp	Ile	Asp	Phe 165	Leu	Ala	Glu	Lys	Asp 170	His	Thr	Thr	Leu	Leu 175	Ser
Glu	Val	Met	Thr 180	Pro	Arg	Ile	Glu	Leu 185	Val	Val	Ala	Pro	Ala 190	Gly	Val
Thr	Leu	Lys 195	Glu	Ala	Asn	Glu	Ile 200	Leu	Gln	Arg	Ser	Lys 205	Lys	Gly	Lys
Leu	Pro 210	Ile	Val	Asn	Asp	Cys 215	Asp	Glu	Leu	Val	Ala 220	Ile	Ile	Ala	Arg
Thr 225	Asp	Leu	Lys	Lys	Asn 230	Arg	Asp	Tyr	Pro	Leu 235	Ala	Ser	Lys	Asp	Ser 240
Gln	Lys	Gln	Leu	Leu 245	Cys	Gly	Ala	Ala	Val 250	Gly	Thr	Arg	Glu	Asp 255	Asp
Lys	Tyr	Arg	Leu 260	Asp	Leu	Leu	Thr	Gln 265	Ala	Gly	Val	Asp	Val 270	Ile	Val
Phe	His	Ser 275	Ser	Gln	Gly	Asn	Ser 280	Val	Tyr	Gln	Ile	Ala 285	Met	Val	His
Tyr	Ile 290	Lys	Gln	Lys	Tyr	Pro 295	His	Leu	Gln	Val	Ile 300	Gly	Gly	Asn	Val

305					310					315					320
Leu	Arg	Val	Gly	Met 325	Gly	Cys	Gly	Ser	Ile 330	Cys	Ile	Thr	Gln	Glu 335	Val
Met	Ala	Cys	Gly 340	Arg	Pro	Gln	Gly	Thr 345	Ala	Val	Tyr	Lys	Val 350	Ala	Glu
Tyr	Ala	Arg 355	Arg	Phe	Gly	Val	Pro 360	Ile	Ile	Ala	Asp	Gly 365	Gly	Ile	Gln
Thr	Val 370	Gly	His	Val	Val	Lys 375	Ala	Leu	Ala	Leu	Gly 380	Ala	Ser	Thr	Val
Met 385	Met	Gly	Ser	Leu	Leu 390	Ala	Ala	Thr	Thr	Glu 395	Ala	Pro	Gly	Glu	Tyr 400
Phe	Phe	Ser	Asp	Gly 405	Val	Arg	Leu	Lys	Lys 410	Tyr	Arg	Gly	Met	Gly 415	Ser
Leu	Asp	Pro	Met 420	Glu	Lys	Ser	Ser	Ser 425	Ser	Gln	Lys	Arg	Tyr 430	Phe	Ser
Glu	Gly	Asp 435	Lys	Val	Lys	Ile	Ala 440	Gln	Gly	Val	Ser	Gly 445	Ser	Ile	Gln
Asp	Lys 450	Gly	Ser	Ile	Gln	Lys 455	Phe	Val	Pro	Tyr	Leu 460	Ile	Ala	Gly	Ile
Gln 465	His	Gly	Cys	Gln	Asp 470	Ile	Gly	Ala	Arg	Ser 475	Leu	Ser	Val	Leu	Arg 480
Ser	Met	Met	Tyr	Ser 485	Gly	Glu	Leu	Lys	Phe 490	Glu	Lys	Arg	Thr	Met 495	Ser
Pro	Gln	Ile	Glu 500	Gly	Gly	Val	His	Gly 505	Leu	His	Ser	Tyr	Glu 510	Lys	Arg

Leu Tyr